QUALITATIVE CHEMICAL ANALYSIS

The information in the solubility table can be applied to create diagnostic tests for the presence of specific ions in aqueous solution. Chemists can use the solubility rules to determine the presence of certain ions in solution by conducting double displacement reactions: they use solutions that contain ions that form a precipitate with the ions they wish to detect.

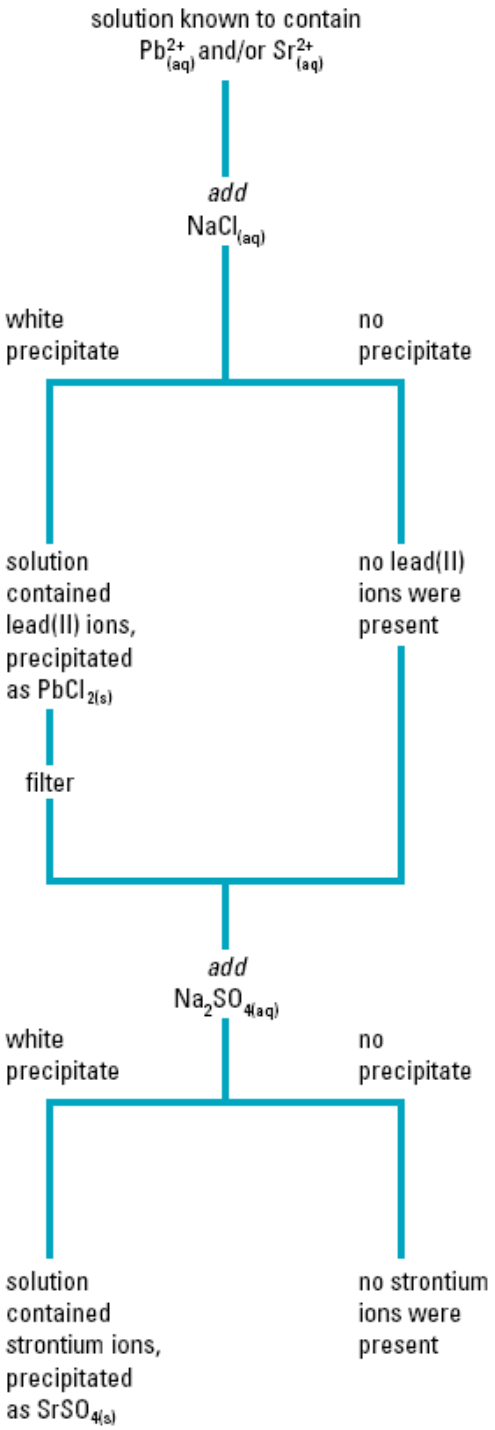

Figure 5
Reading down, we see that this is one experimental design for analyzing a solution for lead(II) and/or strontium ions. In this example, the two tests could not be done in reverse order, because both lead(II) and strontium ions precipitate with sulfate ions.

SUMMARY

To complete a sequential analysis involving solubility, follow these steps. (These steps are written for cation (metal ion) analysis. For anion analysis, reverse the words cations and anions.)

1. Locate the possible cations on the solubility table.
2. Determine which anions precipitate the possible cations.
3. Plan a sequence of precipitation reactions that uses anions to precipitate a single cation at a time.
4. Use filtration between steps to remove cation precipitates that might interfere with subsequent additions of anions.
5. Draw a flow chart to assist your testing and communication.